

1. One way to show that two triangles are similar is to show that
- A. a side of one is congruent to a side of the other
 - B. an angle of one is congruent to an angle of the other
 - ☒ C. three angles of one are congruent to three angles of the other
 - D. two sides of one are proportional to two sides of the other

2. Which set of side lengths form a triangle?

~~A. 1, 2, 3~~
☒ C. 15, 12, 9

~~B. 19, 7, 11~~
~~D. 28, 41, 13~~

3. Solve: $\frac{5}{9} = \frac{x}{108}$

A. 72

C. 21.6

B. 12

☒ D. 60

4. Twenty-five feet of copper tubing weighs 12 pounds. How much will 150 feet of the same tubing weigh?

A. 12 lbs

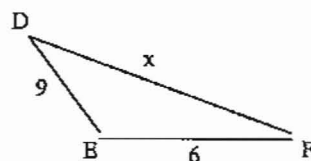
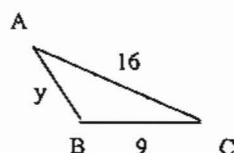
C. 50 lbs

$$\frac{25}{12} = \frac{150}{x}$$

B. 36 lbs

☒ D. 72 lbs

5. Given that $\triangle ABC \sim \triangle DEF$, solve for x and y.



$$\frac{9}{6} = \frac{3}{2}$$

$$\frac{3}{2} = \frac{y}{9} \quad 13.5$$

A. $x = 10.67, y = 14.5$

C. $x = 11.67, y = 14.5$

☒ B. $x = 10.67, y = 13.5$

D. $x = 11.67, y = 13.5$

$$\frac{3}{2} = \frac{16}{x}$$

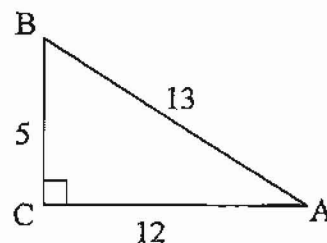
$$10\frac{2}{3}$$

6. In a 30 - 60 - 90° triangle, the hypotenuse is _____ times the shorter leg:
- A. 3
B. $3\sqrt{2}$
C. $2\sqrt{3}$
D. 2
7. If the hypotenuse of a 45-45-90 triangle is 5, what is the measure of the leg?
- A. $\frac{5\sqrt{2}}{2}$
B. $5\sqrt{2}$
C. $\frac{5\sqrt{3}}{3}$
D. 10
8. The length of the legs of a right triangle are 4cm and 7cm. Find the length of the hypotenuse.
- A. 14
B. 9.899
C. 12.124
D. 8.062
9. The length of the hypotenuse of a right triangle is 61 inches. The length of a side is 11 inches. Find the length of the other side.
- A. 36
B. 7.07
C. 60
D. 61.98
10. Which of the following can be the lengths of the sides of a right triangle?
- A. 3, 7, 10
B. 3, 7, 11
C. 0.5, 7, 7
D. none of these

For questions 11 - 13, use the figure shown on the right.

11. Find $\sin A$.

- A. $\frac{5}{12}$
- B. $\frac{5}{13}$
- C. $\frac{12}{13}$
- D. $\frac{12}{5}$

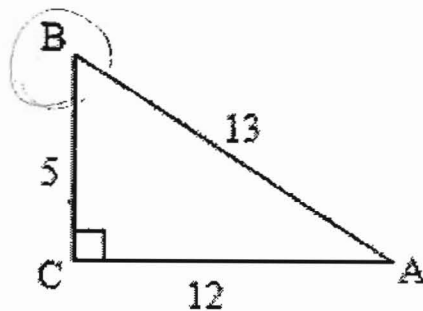


12. Find $m\angle B$ to the nearest degree.

A. 22
C. 67

B. 24
D. 76

$$\sin B = \frac{12}{13}$$



13. Fill in the blank. $\sin B = \frac{12}{13}$

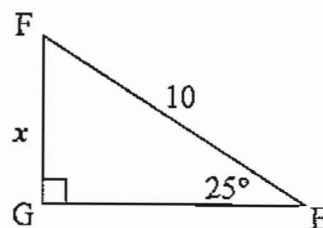
A. tan
C. sin

B. cos
D. none of these

14. Use the figure at the right to determine FG .

A. 4.2
C. 9.1

B. 4.7
D. 23.6



$$\sin 25 = \frac{x}{10}$$

15. Given $\triangle RST \sim \triangle PLK$, which of the following is correct.

A. $\frac{RS}{LK} = \frac{ST}{LK}$

B. $\frac{RS}{PL} = \frac{LK}{ST}$

C. $\frac{ST}{LK} = \frac{RT}{PK}$

D. $\frac{RT}{PK} = \frac{RS}{LK}$

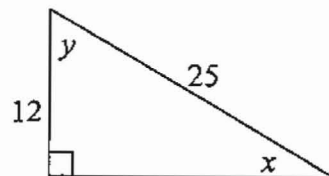
16. Find the value of x and y . Round to the nearest whole number.

A. $x = 29^\circ, y = 61^\circ$

B. $x = 64^\circ, y = 26^\circ$

C. $x = 26^\circ, y = 64^\circ$

D. $x = 61^\circ, y = 29^\circ$



$$\sin x = \frac{12}{25}$$

$$x = 29$$

17. Which of the following triangles would be classified as right?

A. 3, 8, 9

B. 6, 9, 12

C. 2.5, 6, 6.5

D. 10, 15, 20

18. Simplify the following radical: $\sqrt{108}$.

A. $3\sqrt{12}$

B. $6\sqrt{3}$

C. $3\sqrt{6}$

D. $12\sqrt{3}$

19. Solve: $\frac{x+11}{7} = \frac{x+3}{5}$

A. 17

B. 34

C. 38

D. 11

$$5x + 55 = 7x + 21$$

$$34 = 2x$$

$$x = 17$$

20. Find the geometric mean of 6 & 24.

A. 30

B. 15

C. 9

D. 12

$$\frac{6}{x} = \frac{x}{24}$$

$$x = 12$$

Use the triangles on the right to answer 21 & 22.

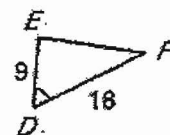
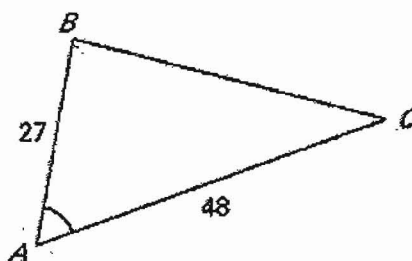
21. Which similarity statement is true?

A. $\triangle ABC \sim \triangle DEE$

~~B. $\triangle BAC \sim \triangle EFD$~~

C. $\triangle BAC \sim \triangle EFD$

D. $\triangle CAB \sim \triangle FDE$



22. Which postulate justifies the triangles are similar?

A. AA

B. SSS

C. SAS

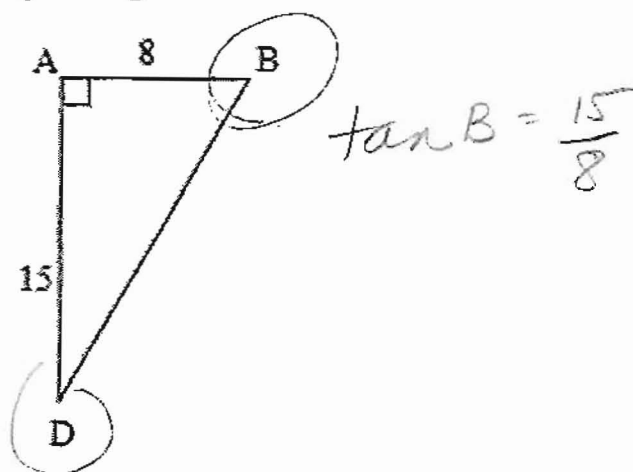
D. ASA

23. Use trig ratios to find the missing information in the right triangle.

$$m\angle B = \underline{61.9}$$

$$m\angle D = \underline{28.1}$$

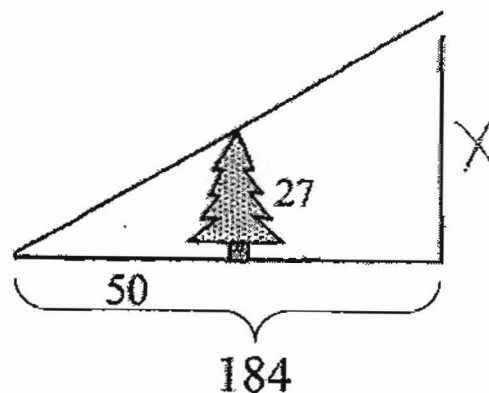
$$BD = \underline{17}$$



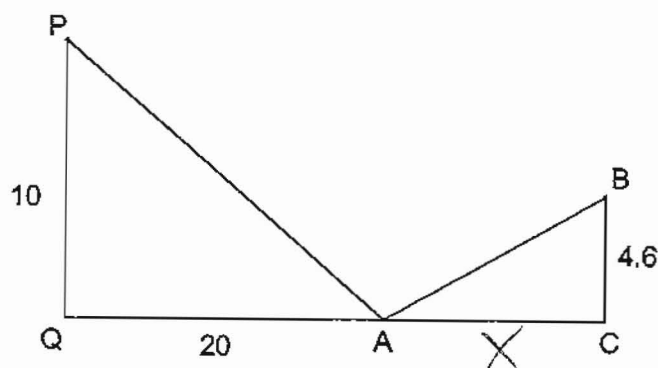
24. Kate wants to find the height of the tallest building in the city. She stands 184 feet away from the tallest building. There is a tree 50 feet in front of her, which she knows is 27 feet tall. How tall is the building? (Round to the nearest foot.)

$$\frac{27}{50} = \frac{x}{184}$$

$$\underline{99.36}$$



25. $\triangle APQ \sim \triangle ABC$, find the length of AC .



$$\frac{10}{4.6} = \frac{20}{x}$$

$$\underline{9.2}$$

26. Use trig ratios to find the missing pieces of the right triangle.

$$x = \underline{30.66}$$

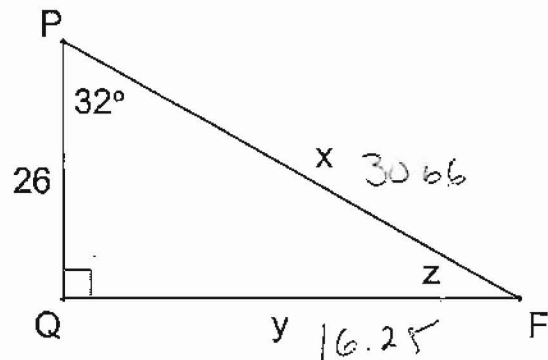
$$\cos 32 = \frac{26}{x}$$

$$y = \underline{16.25}$$

$$z = \underline{57.9 \approx 58}$$

$$\tan 32 = \frac{y}{26}$$

$$\sin z = \frac{26}{30.66}$$



27. Use the given information to find the missing measurements. J, K, and L are midpoints.

$$EK = 8x + 12$$

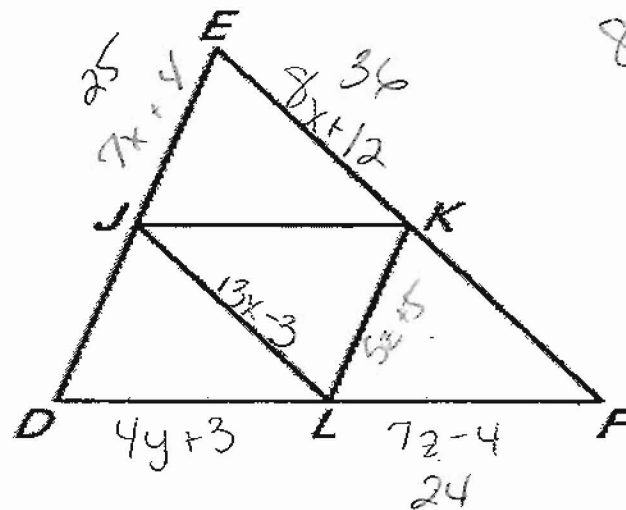
$$JL = 13x - 3$$

$$EJ = 7x + 4$$

$$KL = 5z + 5$$

$$DL = 4y + 3$$

$$LF = 7z - 4$$



$$8x + 12 = 13x - 3$$

$$-5x = -15$$

$$x = +3$$

$$5z + 5 = 25$$

$$5z = 20$$

$$z = 4$$

$$x = \underline{3}$$

$$EF = \underline{72}$$

$$y = \underline{21/4 = 5.25}$$

$$JD = \underline{25}$$

$$z = \underline{4}$$

$$JK = \underline{24}$$

$$4y + 3 = 24$$

$$4y = 21$$

28. List the sides and angles in order from smallest to largest.

ANGLES

$\angle C$

$\angle B$

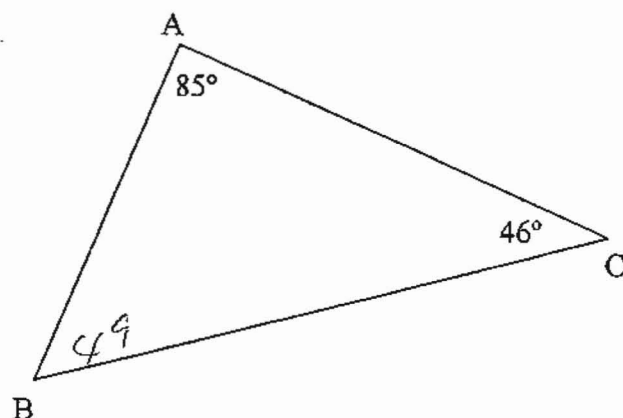
$\angle A$

SIDES

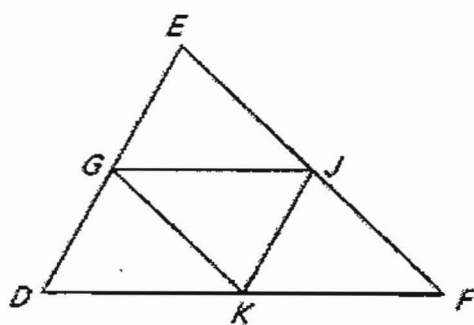
AB

AC

BC



29. In $\triangle DEF$, $\overline{EJ} \cong \overline{JK}$, $\overline{FK} \cong \overline{KD}$, and $\overline{DG} \cong \overline{GE}$.



$$\overline{GJ} \parallel \overline{DF}$$

$$\overline{DE} \parallel \overline{JK}$$

$$\overline{EJ} \cong \overline{JK} \cong \overline{GK}$$

$$\overline{GJ} \cong \overline{DK} \cong \overline{KF}$$

30. Simplify the ratio:

$$a. \frac{40 \text{ in}}{4 \text{ ft}} = \frac{40}{48} = \frac{10}{12} = \left(\frac{5}{6} \right)$$

$$b. \frac{2 \text{ hr}}{40 \text{ min}} = \frac{120}{40} = \left(\frac{3}{1} \right)$$

31. Solve the proportion:

$$a. \frac{3}{x} = \frac{7}{11} \quad 33 = 7x$$

$$x =$$

$$x = \underline{4.71} \approx \frac{33}{7}$$

$$b. \frac{2x-5}{20} = \frac{7}{11}$$

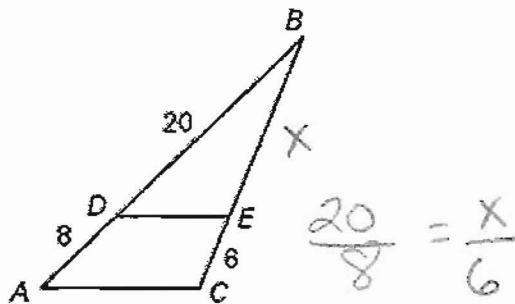
$$22x - 55 = 140$$

$$\frac{195}{22}$$

$$x = \underline{8.86}$$

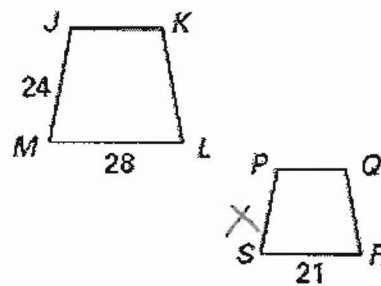
32. Use the diagram and the given information to find the unknown length.

a. Given $\frac{BD}{DA} = \frac{BE}{EC}$, find BE .



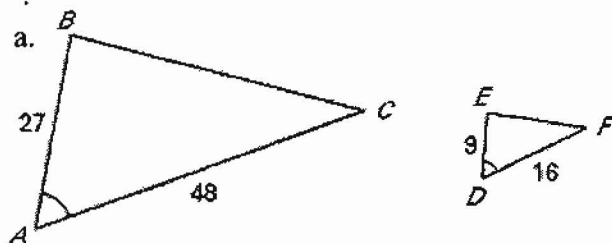
$BE = \underline{15}$

b. Given $\frac{JM}{PS} = \frac{ML}{SR}$, find PS .



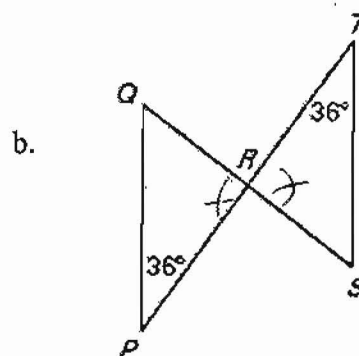
$PS = \underline{18}$

33. Determine if the triangles are similar. If so, state the correct postulate and complete the similarity statement.

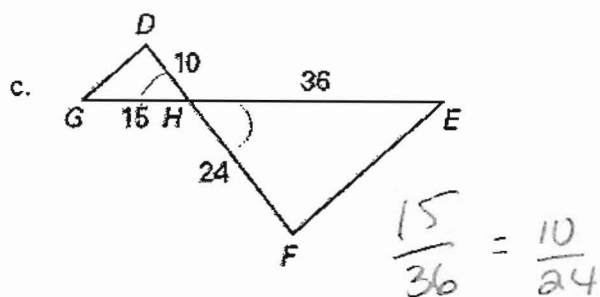


Postulate: SAS
 $\triangle ABC \sim \triangle \underline{DEF}$

$$\frac{27}{9} = \frac{48}{16}$$

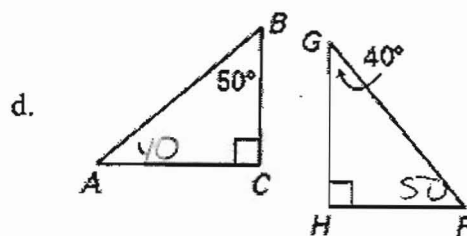


Postulate: AA
 $\triangle PRQ \sim \triangle \underline{TRS}$



Postulate: SAS

$\triangle DGH \sim \triangle FEH$



Postulate: AA

$\triangle ABC \sim \triangle GFH$

34. Complete the similarity statement. Write the corresponding SIDES (not lengths) that are proportional. Solve for the missing lengths.

$\angle M = \angle O$

$MT = 9$

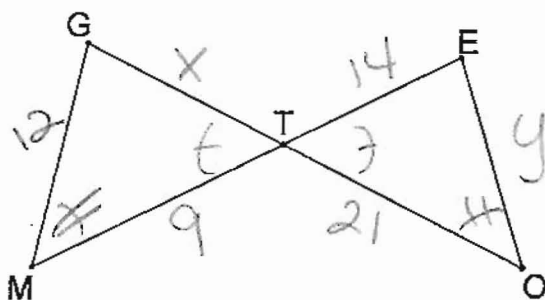
$MG = 12$

$TE = 14$

$TO = 21$

$GT = x$

$EO = y$



$\frac{9}{21} = \frac{12}{y}$ $\frac{9}{21} = \frac{x}{14}$

$\triangle MTG \sim \triangle OTE$

$\frac{MT}{OT} = \frac{TG}{TE} = \frac{MG}{OE}$

$x = \underline{6}$

$y = \underline{28}$

35. The scale factor between two triangles is 3:5. If the sides of the smaller triangle are 6, 9 & 15, find the lengths of the sides of the larger triangle.

$x = 10$
 $y = 15$
 $z = 25$

$\frac{3}{5} = \frac{6}{x}$ $\frac{3}{5} = \frac{9}{y}$ $\frac{3}{5} = \frac{15}{z}$

36. Simplify the following radicals:

a. $\frac{\sqrt{24}}{\sqrt{18}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

b. $3\sqrt{90} = 3\sqrt{9 \cdot 10} = 9\sqrt{10}$

c. $\frac{\sqrt{5}}{\sqrt{3}} = \frac{\sqrt{15}}{3}$

d. $4\sqrt{24} + 2\sqrt{54} =$

$8\sqrt{6} + 6\sqrt{6}$

$(14\sqrt{6})$

e. $\sqrt{36} \cdot \sqrt{18} =$

$6 \cdot 3\sqrt{2}$

$(18\sqrt{2})$

g. $3\sqrt{45} - \sqrt{20}$

$3\sqrt{5} - 2\sqrt{5}$

$(\sqrt{5})$

37. Use trig ratios to find the missing parts of the triangle.

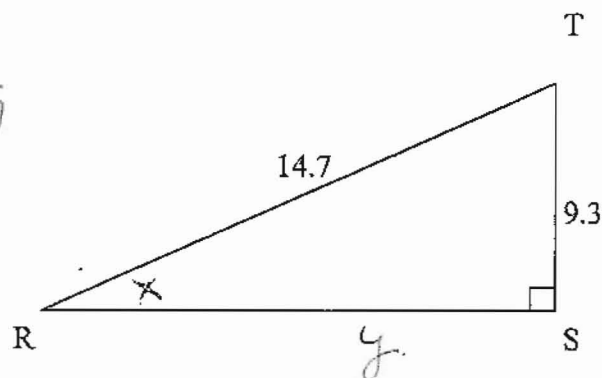
$m\angle R = 39.2$

$\sin x = \frac{9.3}{14.7}$

$m\angle T = 50.8$

$RS = 11.4$

$\cos 39.2 = \frac{y}{14.7}$

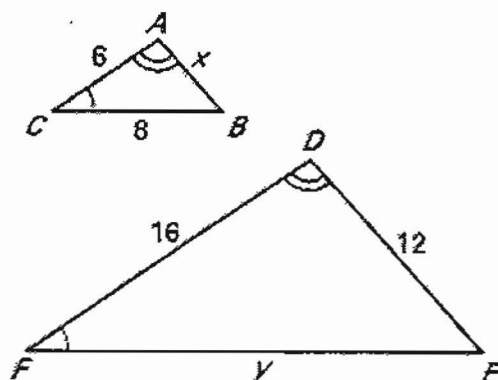


38. Use the diagram to solve the following.

$\triangle ABC \sim \triangle DEF$

$x = 4.5$

$y = 2\frac{1}{3}$



$\frac{6}{16}$

$\frac{3}{8} = \frac{8}{y}$

$\frac{3}{8} = \frac{x}{12}$